



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/673,953	12/21/2000	Atsushi Ito	Q60755	8878

7590 12/24/2003
Sughrue Mion Zinn
Macpeak & Seas
Suite 800
2100 Pennsylvania Avenue NW
Washington, DC 20037-3213

EXAMINER

PATEL, PARESH H

ART UNIT PAPER NUMBER

2829

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/673,953

Applicant(s)

ITO ET AL.

Examiner

Paresh Patel

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 55-57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 09/15/2003 have been fully considered but they are not persuasive.

2. In view of applicant's argument, rejection of last office action under 35 USC §102(f) and Obviousness-Type Double Patenting are withdrawn. However, Examiner does not agree with applicant's argument for rejection based on Yamaguchi.

3. Original claims 1-20 now cancelled by the applicant. Claims 21-57 are newly added. Claims 21-47 includes the limitation "A wafer prober for probing a semiconductor wafer" in a preamble. Claims 48-57 includes "A ceramic wafer substrate for a wafer prober" in the preamble.

4. In the remarks at page 17, applicant argues that Yamaguchi et al. discloses wiring board which is not used **for probing a wafer and does not teach that when a ceramic substrate with high rigidity is used for a wafer prober**. Applicant agrees with teaching of Yamaguchi et al. that he does contain a disclosure related to a wafer prober, and does not suggest to use a wiring board for probing a wafer. Later, applicant cited cases laws (Corning Glass Works v. Sumitomo Electric U.S.A. Inc. 9 USPQ 2d 1962, 1966 (CA FC19898) and Kropa v. Robie, 88 USPQ 478 at 481 (CCPA 1951)) in order to support preamble language in the new claims.

Examiner disagrees with applicant because preamble (i.e. "for probing a wafer" of claims 21 and 33 and "for a wafer prober" of claims 48 and 55) as claimed is a function recitation of said wafer prober and said ceramic substrate, therefore it does not

distinguish over prior art. In order to distinguish over prior art, a functional recitation must be expressed as a "means" for performing the specified function, as set forth 35 U.S.C. 112, 6th paragraph, and must be supported by recitation in the claim of sufficient stricture to warrant the presence of the functional language. *In re Fuller*, 1929 C.D. 172; 388 O.G.279. Also, *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951) states: a preamble is denied the effect of a limitation where **the claim is drawn to structure** and the portion of the claim following the preamble is **a self-contained description of the structure** not depending for completeness upon the introductory clause (e.g. in claims 21 and 33, the limitation in the preamble "a wafer prober for probing a semiconductor wafer", wherein a wafer prober having a ceramic substrate and a conductor layer, and ceramic substrate comprising nitride ceramics is a self –contained description of a structure "wafer prober" and not depending from "probing a semiconductor wafer".). Applicant later argues that IBM '403 and Tsujide does not teach "for probing a wafer". Examiner again disagrees with applicant for the same reason as above.

Claim Objections

5. Claim 32 is objected to because of the following informalities: what is probing is not clear . Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 32, it is clear that, wafer prober performs probing by pressing probe card on the wafer, but what is not clear is probing itself or probing to do what?

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claims 21 and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamaguchi et al. (JP 63-047382).

Regarding claims 21 and 48 (new) Yamaguchi et al. (hereafter Yamaguchi) discloses: a wafer prober (wiring board of the Abstract) for probing a semiconductor wafer having a ceramic substrate [ceramic board of Abstract] and a conductor layer [electrical conductor of the Abstract] formed on a surface of said ceramic substrate, wherein said ceramic substrate comprises at least one selected from the group consisting of nitride ceramics [nitride ceramic of the Abstract], carbide ceramics and oxide ceramics.

9. Claims 21-23, 25, 27-32, 36-39, 41-43, 45-50, 52 and 54 are rejected under 35 U.S.C. 102(e) as being anticipated by Nagasaki et al. (US 5886863).

Regarding claims 21 and 48 (new) Nagasaki et al. (hereafter Nagasaki) in fig. 12a-b discloses: a wafer prober [301,302] for probing a semiconductor wafer having a ceramic substrate [301] and a conductor layer [302 and lines 51-56 of column 22] formed on a surface of said ceramic substrate, wherein said ceramic substrate comprises at least one selected from the group consisting of nitride ceramics [lines 5-9 of column 23], carbide ceramics and oxide ceramics.

Regarding claims 22 and 49 (new) Nagasaki discloses said ceramic substrate is equipped with a temperature control means [307].

Regarding claims 23 and 50 (new) Nagasaki discloses said temperature control means is a heating element [307].

Regarding claims 25 and 52 (new) Nagasaki discloses channels are formed on said surface of said ceramic substrate [gap between 302 or channels for 307 or 306].

Regarding claim 27 (new) Nagasaki discloses said conductor layer is a chuck top conductor layer [302].

Regarding claim 28 (new) Nagasaki discloses said conductor layer has a thickness of 1 to 20 μm [lines 41-48 of column 5 and lines 44-53 of column 23].

Regarding claim 29 (new) Nagasaki discloses a noble metal layer is formed on said surface of said conductor layer [lines 54-61 of column 23].

Regarding claims 30, 36 and 54 (new) Nagasaki discloses said conductor layer comprises nickel (porous material for claims 36 and 54) [lines 9-16 of column 9, Kovar and lines 54-57 of column 23].

Regarding claim 31 (new) Nagasaki discloses said conductor layer comprises a titanium layer, a molybdenum layer and a nickel layer in this order [lines 1-5 of column 18].

Regarding claim 32 (new) Nagasaki discloses a probing of a semiconductor wafer by pressing a probe card [inherent to lines 55-62 of column 21 because application of voltage to wafer requires probe card] on the wafer.

Regarding claim 37, (new) Nagasaki discloses said conductor layer has a thickness of 1 to 200 μm [lines 41-48 of column 5 and lines 44-53 of column 23].

Regarding claim 38, (new) Nagasaki discloses said conductor layer is a chuck top conductor layer [302].

Regarding claim 39, (new) Nagasaki discloses said ceramic substrate is equipped with a temperature control means [307].

Regarding claim 41, (new) Nagasaki discloses said temperature control means is a heating element [307].

Regarding claim 42, (new) Nagasaki discloses at least one conductor layer is formed inside [306] said ceramic substrate.

Regarding claim 43, (new) Nagasaki discloses channels are formed on said surface of said ceramic substrate [gap between 302 or channels for 306 or 307].

Regarding claim 45, (new) Nagasaki discloses a noble metal layer is formed on the surface of said conductor layer [lines 54-61 of column 23].

Regarding claim 46, (new) Nagasaki discloses said conductor layer comprises nickel [lines 9-16 of column 9 and Kovar].

Regarding claim 47, (new) Nagasaki discloses said conductor layer comprises a titanium layer, a molybdenum layer and a nickel layer in this order [lines 1-5 of column 18].

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 24, 40 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasaki as applied to claims 21 and 48 above, and further in view of Zehnpfenning et al. (US 4385435).

Regarding claims 24, 40 and 51, Nagasaki discloses all the elements except for ceramic substrate is equipped with a Peltier device. However, Nagasaki discloses heating element 307. Zehnpfenning et al. (hereafter Zehnpfenning) discloses said Peltier device [lines 40-44 of column 6, also see US 3037064; and 3037065 for peltier device] to provide heating and cooling to the wafer or platen 12c to which it is embedded. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to include peltier device of Zehnpfenning with wafer prober of Nagasaki, in order to control the thermal expansion of the platen or wafer.

12. Claims 26, 44 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasaki as applied to claim 21 and 48 above.

Regarding claims 26, 44 and 53 (new) Nagasaki discloses all the elements except for **air suction holes** . Nagasaki is silent about **said channels** formed on said surface of said ceramic substrate **are provided with air suction holes**. However, Nagasaki at lines 66-67 of column 1 and 1-2 of column 2 discloses use of vacuum chuck as wafer support member. Also, it is known in the art that vacuum chuck has air suction holes to hold the wafer. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use vacuum chuck of

Nagasaki with suction holes to hold the wafer during testing or other processes during manufacturing.

13. Claims 33-35 and 55-57 are rejected under 35 U.S.C. 102(e) as being anticipated by Nagasaki et al. (US 5886863).

Regarding claims 33 and 55 (new) Nagasaki et al. (hereafter Nagasaki) in fig. 12a-b discloses a wafer probe [301, 302] for probing a semiconductor wafer [310] having a ceramic substrate [301] and a conductor layer [302 and lines 51-56 of column 22] formed **on** a surface of said ceramic substrate and at least one conductor layer [306] formed **inside** said ceramic substrate.

Regarding claims 34 and 56, (new) Nagasaki discloses said ceramic substrate is equipped with a temperature control means [307].

Regarding claims 35 and 57, (new) Nagasaki discloses said temperature control means is a heating element [307].

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paresh Patel whose telephone number is 703-306-5859 or 571-272-1968. The examiner can normally be reached on 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 703-308-1233 or 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Paresh Patel
Dec. 15, 2003


KAMAND CUNEO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800